

ABSTRACT

A magnetron sputtering apparatus 1 is composed of a vacuum chamber 2, a target 3, a cathode 4 that holds the target 3 in the vacuum chamber 2, a substrate 5, an anode 6 that holds the substrate 5 and is allocated above the cathode 4 so as to face the substrate 5 toward the target 3 on the cathode 4, a permanent magnet 71 that generates magnetic field 141 and is allocated under the cathode 4, and a rotation controller 12 for rotating the permanent magnet 71 so as to pivot on a center axis of the target 3. The permanent magnet 71 is further composed of a base 8, a first permanent magnet 91 that is fixed on the base 8 in the middle and a second permanent magnet 101 in a ring shape that is fixed in an external circumferential area of the base 8 so as to surround the first permanent magnet 91, wherein a magnetic polarity of the second permanent magnet 101 is inverse with respect to that of the first permanent magnet 91 and magnetic field strength of the second permanent magnet 101 is weaker than that of the first permanent magnet 91, and further an upper portion of the permanent magnet 71 is in a cylindrical shape of which top portion is cut diagonally.